Keyence VHX-7000 Optical Microscope

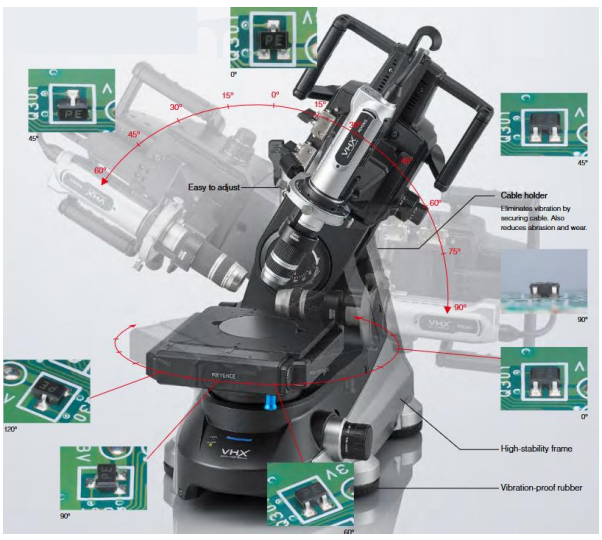
POLiS
Post Lithium Storage
Cluster of Excellence

Specifications

- Seamless zoom from 20x to 6000x using a motorized turret, allowing detailed observations without manual changing lenses
- 3D Profiling: Captures height variations across a surface to analyze roughness.
- Calculates common roughness metrics like R_a (average roughness), R_z (maximum height), and R_q (root mean square roughness).
- Non-Contact Measurement: Unlike traditional stylus-based profilometers, the VHX-7000 performs non-destructively.

Description

The Keyence VHX-7000 is a 4K high-accuracy digital microscope designed for detailed inspection and failure analysis. It features fully-focused imaging capabilities, even at high magnifications, without the need for focus adjustments. The system includes a motorized turret supporting automatic observation from 20x to 6000x magnification, a motorized XYZ stage for precise positioning and focusing, and a high-resolution lens with a maximum numerical aperture (NA) of 0.9. Additionally, it is equipped with a 12-megapixel 4K CMOS image sensor, providing six times the detail at every magnification level.



Further information

- 3D Imaging & Measurement – Captures height information for 3D display and color mapping.
- High-Resolution 4K Imaging – Provides ultra-clear images for detailed inspections.
- Fully-Focused Imaging – Eliminates the need for manual focus adjustments.
- Multi-Angle Observation – Allows lens tilting and rotation while keeping the target centered.
- Depth Composition – Automatically combines multiple images to create a fully-focused view.
- Automatic Area Measurement – Measures surface areas, roughness, and dimensions.
- Non-Destructive Analysis – Enables precise inspection without damaging the sample.
- Advanced Lighting Options – Adjustable multi-directional illumination for optimal contrast.

Publications

Always important for images for the supplementary information file, as e.g. in

[1] S. Saleh, S. Daboss, T. Philipp, D. Schaefer, M. Rohnke, C. Kranz, ChemElectroChem 2025, e202400707.